Detecting Superconductivity Out-of-Equilibrium

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Host: David Schlegel (Prof. Vincenzo Savona)

Date and time: **Friday April 9th, at 15:15**

Place: <https://epfl.zoom.us/j/89778378177>

Abstract: Recent pump-probe experiments on underdoped cuprates and similar systems suggest the existence of a transient superconducting state above T\_c. This poses the question how to reliably identify the emergence of long-range order, in particular superconductivity, out-of-equilibrium. We investigate this point by studying a quantum quench in an extended Hubbard model and by computing various observables, which are used to identify (quasi-)long-range order in equilibrium. Our findings imply that, in contrast to current experimental studies, it does not suffice to study the time evolution of the optical conductivity to identify superconductivity. In turn, we suggest to utilize time-resolved ARPES experiments to probe for the formation of a condensate in the two-particle channel.

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Salvatore Manmana obtained his PhD from the Universities of Stuttgart and Marburg in 2006 for a thesis on nonequilibrium dynamics of strongly correlated quantum systems, under the supervision of Profs. Reinhard Noack and Alejandro Muramatsu. He then joined the group of Frédéric Mila for a postdoc at EPFL, before moving to JILA/University of Colorado in Boulder in 2010 to work with Ana Maria Rey, Victor Gurarie, Murray Holland.
Since 2012 he is at the Institute for Theoretical Physics in Göttingen University and received his Habilitation in Theoretical Physics in 2015. He has been substitute professor in Göttingen and in Marburg, and since 2018 he is the coordinator for the teaching in theoretical physics.